3.3.8.3 Boreal Rich Fen

3.3.8.3.1 Community Overview

Boreal rich fen is a rare open peatland community of northern Wisconsin that is associated with glacial moraines, or less commonly, outwash landforms, in which the underlying substrate includes calcareous materials. Like many other "northern" peatlands, nutrient levels are low, but pH is significantly higher than in the poor fen and open bog communities and influences the plant composition. Sphagnum mosses are of lesser importance in this type than are the so-called "brown" mosses (e.g., from the genera *Campyllium, Drepanocladus,* or *Scorpidium*). Characteristic vascular plants may include woolly sedge, twig-rush, white beak-rush, beaked bladderwort, rushes, Hudson Bay cotton-grass, rush aster, and buckbean.

The "richest" northern fens occur on the Door Peninsula, which is underlain by calcareous bedrock and mantled with calcareous till. Here, in addition to the species mentioned above, the open peatlands may support species such as coast sedge, linear-leaved sundew, brook lobelia, grass-of-Parnassus, shrubby cinquefoil, hair beak-rush, and tufted bulrush. The proximity of carbonate-enriched bedrock is almost certainly among the factors responsible for the composition of the northern fens in this region.

Shrub phases of the boreal rich fen community also occur, in which shrubby cinquefoil, bog birch, sage willow, and speckled alder may be present in significant amounts, and collectively form the dominant plant cover.

3.3.8.3.2 Vertebrate Species of Greatest Conservation Need Associated with Boreal Rich Fen

Seven vertebrate Species of Greatest Conservation Need were identified as moderately associated with boreal rich fen (Table 3-176). There were not any vertebrate Species of Greatest Conservation Need that were identified as significantly associated with boreal rich fen communities.

Table 3-176. Vertebrate Species of Greatest Conservation Need that are (or historically were) moderately associated with boreal rich fen communities.

Birds
Connecticut Warbler
Canada Warbler
Herptiles
Mink Frog
Mammals
Northern Long-Eared Bat
Silver-Haired Bat
Eastern Red Bat
Hoary Bat

In order to provide a framework for decision-makers to set priorities for conservation actions, the species identified in Table 3-176 were subject to further analysis. The additional analysis identified the best opportunities, by Ecological Landscape, for protection, restoration, and/or management of both Boreal rich fen and associated vertebrate Species of Greatest Conservation Need. The steps of this analysis were:

- Each species was examined relative to its probability of occurrence in each of the 16 Ecological Landscapes in Wisconsin. This information was then cross-referenced with the opportunity for protection, restoration, and/or management of Boreal rich fen in each of the Ecological Landscapes (Table 3-177).

Table 3-177. Vertebrate Species of Greatest Conservation Need that are (or historically were) *moderately* associated with boreal rich fen communities and their association with Ecological Landscapes that support boreal rich fens.

Boreal Rich Fen	Birds (2)*		Herptiles (1)	Mammals (4)			
Ecological Landscape grouped by opportunity for management, protection, and/or restoration of this community type	Connecticut Warbler	Canada Warbler	Mink Frog	Northern Long-eared Bat	Silver-haired Bat	Eastern Red Bat	Hoary Bat
MAJOR							
Northern Lake Michigan Coastal							
IMPORTANT							
North Central Forest							
Northeast Sands							
Northern Highland							

Color Key

= **HIGH probability the species occurs in this Ecological Landscape**

= **MODERATE probability the species occurs in this Ecological Landscape**

= **LOW or NO probability the species occurs in this Ecological Landscape**

*** The number shown in parentheses is the number of Species of Greatest Conservation Need from a particular taxa group that are included in the table. Taxa groups that are not shown did not have any Species of Greatest Conservation Need that met the criteria necessary for inclusion in this table.**

3.3.8.3.3 Threats and Priority Conservation Actions for Boreal Rich Fen

3.3.8.3.3.1 Statewide Overview of Threats and Priority Conservation Actions for Boreal Rich Fen

The following list of threats and priority conservation actions were identified for boreal rich fen in Wisconsin. The threats and priority conservation actions described below apply to all of the Ecological Landscapes in Section 3.3.8.3.3.2 unless otherwise indicated.

Threats and Issues

- Disruption of hydrology due to ditching, dredging, dike or road construction, and excessive withdrawal of groundwater are among the disturbances that can adversely affect site hydrology.
- The colonization by and spread of invasive plants, especially glossy buckthorn, is a serious problem in northeastern Wisconsin.
- The addition of excess nutrients to this habitat can alter conditions and reduce the ability of the community to support sensitive plants that have relatively narrow habitat tolerances. If streams, overland flow, or polluted groundwater allow nutrient levels to rise appreciably, there may be a trend toward developing more marsh-like characteristics. Robust graminoid species like cat-tails or the invasive giant reed become dominant, and there is corresponding reduction in the diversity and abundance of the more sensitive native species.

Priority Conservation Actions

- Protect or restore site hydrology.
- Protect water quality from pollutants and excess sediments.
- Control invasive plants. Support research to identify and develop effective and practical means of controlling invasive plants.
- Work with public lands managers and private conservation organizations to implement appropriate management and protection measures.
- Conduct additional inventory work in selected regions of Wisconsin to identify and better document occurrences of this community type.
- Manage as part of a vegetation mosaic that includes other open wetland communities, shrub swamp, and swamp conifer forest.
- Promote the establishment of effective buffer areas on adjoining uplands.
- Additional inventory work is needed to better document the distribution, status, composition and structure of this community type in Wisconsin.

3.3.8.3.3.2 Additional Considerations for Boreal Rich Fen by Ecological Landscape

Special considerations have been identified for Ecological Landscapes where major or important opportunities for protection, restoration, and/or management of boreal rich fen exist. Those considerations are described below and are in addition to the statewide threats and priority conservation actions for boreal rich fen found in Section 3.3.8.3.3.1.

Additional Considerations for Boreal Rich Fen in Ecological Landscapes with ***Major*** Opportunities for Protection, Restoration, and/or Management

Northern Lake Michigan Coastal

All occurrences identified to date are on the Door Peninsula. Groundwater pollution is a significant threat in this Ecological Landscape, because of the nearness to the surface of the fractured, soluble bedrock.

Additional Considerations for Boreal Rich Fen in Ecological Landscapes with ***Important*** Opportunities for Protection, Restoration, and/or Management

North Central Forest

Several rich fens have been described from the northernmost portions of this Ecological Landscape. Additional survey work is needed here, especially on public lands.

Northeast Sands

Several small stands of this type have been documented on public lands in the Northeast Sands. "Rich" conifer forests (white cedar swamps) are very common in this Ecological Landscape, and additional survey work has a good chance of turning up new occurrences of "rich" open peatlands as well.

Northern Highland

"Rich fens" are seemingly an anomaly in this region of deep, acid outwash sands, but there are several good examples known from the Northern Highland-American Legion State Forest.